

**THIS OPINION WAS NOT WRITTEN FOR PUBLICATION**

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 29

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte HIRONOBU KAWAHARA, YOSHINAO KAWASAKI,  
YOSHIAKI SATO and RYOOJI FUKUYAMA

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Appeal No. 95-2728  
Application 07/735,668<sup>1</sup>

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ON BRIEF

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Before GARRIS, WARREN and OWENS, Administrative Patent Judges.  
GARRIS, Administrative Patent Judge.

**DECISION ON APPEAL**

This is a decision on an appeal from the final rejection of claims 21 through 35, 43 through 46 and 48 which are all of the claims remaining in the application.

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<sup>1</sup> Application for patent filed July 26, 1991. According to appellants, this application is a continuation of Application 07/475,204 filed February 5, 1990, now abandoned.

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The subject matter on appeal relates to a plasma etching method and apparatus. This appealed subject matter is adequately illustrated by independent method claims 21 and 48 and by independent apparatus claim 29. A copy of these claims taken from the appellants' brief is appended to this decision.

The references of record relied upon by the examiner to support the final rejection are:

Suzuki et al. (Suzuki)	4,579,623	Apr. 1,
1986		
Kawasaki et al. (Kawasaki)	4,795,529	Jan. 3,
1989		
Arikado et al. (Arikado)	4,878,995	Nov.
7, 1989		
Japanese Kokai Application	158627/85	Aug. 20,
1985		
(Tazi)		

Claim 48 is rejected under 35 U.S.C. § 102(e) as being anticipated by Kawasaki.

Claims 21 through 35, 45 and 46 are rejected under 35 U.S.C. § 103 as being obvious over Kawasaki in view of Arikado and Suzuki, and claims 43 and 44 are correspondingly rejected as being obvious over these references and further in view of Tazi.

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Having carefully studied the record before us, we conclude that the rejection of apparatus claims 29 through 35 and 46 should be sustained but that the rejection of method claims 21 through 28, 43 through 45 and 48 should not be sustained.

The examiner's § 102 and § 103 rejections of the method claims on appeal are based upon her position that the here claimed "residue" corresponds to the protective film formed from plasma polymerization products in Kawasaki's process. However, this position is not well founded for the reasons argued by the appellants in their briefs, which arguments are supported by the disclosure of the subject application and the Kawasaki declarations of record. It follows that the process of Kawasaki, whether or not modified by the other applied prior art, fails to satisfy the appellants' method claim limitations relating to the removal or elimination of a residue via a high acceleration or bias voltage.

In light of the foregoing, we cannot sustain the examiner's § 102 rejection of method claim 48 as being anticipated by Kawasaki or her § 103 rejection of method claims 21 through 28 and 43 through 45 as being unpatentable

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over Kawasaki in view of Arikado and Suzuki alone or further in view of Tazi.

Notwithstanding the above discussed deficiencies of the Kawasaki reference, it is appropriate to sustain the examiner's

§ 103 rejection of apparatus claims 29 through 35 and 46.

This is because it is reasonable to consider patentee's means for generating a high acceleration/bias voltage for removing a protective film as being capable of likewise removing a residue. Stated otherwise, we believe that the corresponding elements claimed by the appellants and disclosed by Kawasaki for generating a high acceleration/bias voltage possess the same characteristics or capabilities. In re Glass, 474 F.2d 1015, 1019, 176 USPQ 529, 532 (CCPA 1973). Viewed from this perspective, the here claimed apparatus is indistinguishable from the apparatus of the Kawasaki reference. The mere fact that the apparatus defined by the appealed claims is utilized for removing a residue (as opposed to removing a protective film as in the Kawasaki method) does not render these claims patentable as the appellants seem to believe. It is well settled that the manner or method in which a machine or

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apparatus is to be utilized is not germane to the issue of patentability of the machine or apparatus itself. In re Casey, 370 F.2d 576, 580, 152 USPQ 235, 238 (CCPA 1967).

Under the circumstances recounted above, we cannot regard the appealed apparatus claims as patentably distinguishable over the apparatus of Kawasaki in the manner argued by the appellants. Therefore, it is appropriate to sustain the examiner's § 103 rejection of apparatus claims 29 through 35 and 46 as being unpatentable over Kawasaki in view of Arikado and Suzuki.

The decision of the examiner is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

**AFFIRMED-IN-PART**

BRADLEY R. GARRIS                    )  
Administrative Patent Judge)

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CHARLES F. WARREN	)	BOARD OF PATENT
Administrative Patent Judge)		APPEALS AND
	)	INTERFERENCES
	)	
TERRY J. OWENS	)	
Administrative Patent Judge)		

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## APPENDIX

21. A plasma etching method for etching a sample with a gas plasma, the sample being cooled to a temperature not higher than OEC, the method comprising the steps of:

generating an acceleration voltage for accelerating ions in the gas plasma toward the sample to etch the sample; and

changing the acceleration voltage between a high acceleration voltage and a low acceleration voltage;

wherein the high acceleration voltage is selected to remove a residue from etched portions of the sample, the residue occurring as a result of the sample being cooled to a temperature not higher than OEC while being etched, the high acceleration voltage being generated for a time sufficient to remove the residue from the etched portions of the sample, and wherein the low acceleration voltage is selected to etch the sample with a high selectivity ratio.

29. A plasma etching apparatus including a vacuum vessel, a sample table disposed in the vacuum vessel, means for supplying a coolant to the sample table for cooling the sample table and a sample disposed on the sample table to a temperature not higher than OEC, and means for generating a gas plasma for etching the sample disposed on the sample table, the apparatus comprising:

means for generating an acceleration voltage for accelerating ions in the gas plasma toward the sample to etch the sample; and

control means for changing the acceleration voltage between a high acceleration voltage and a low acceleration voltage;



wherein the high acceleration voltage is selected to remove a residue from etched portions of the sample, the residue occurring as a result of the sample being cooled to a temperature not higher than OEC while being etched, the high acceleration voltage being generated for a time sufficient to remove the residue from the etched portions of the sample, and wherein the low acceleration voltage is selected to etch the sample with a high selectivity ratio.

48. A plasma etching method for etching a sample with a gas plasma comprising the steps of:

generating a first acceleration voltage for accelerating ions in the gas plasma toward the sample with a first ion energy corresponding to the first acceleration voltage to etch the sample such that a residue is produced; and

generating a second acceleration voltage higher than the first acceleration voltage for accelerating ions in the gas plasma toward the sample with a second ion energy corresponding to the second acceleration voltage to eliminate the residue;

wherein the step of generating a first acceleration voltage and the step of generating a second acceleration voltage are alternately repeated.